The Economics of Woodland Eggs in the UK



Paul J Burgess, V Belot, E Buachie, J Cuartero de Frias, K Nedved, E Rodríguez Arquero

Cranfield University, Cranfield, Bedfordshire, UK

P.Burgess@cranfield.ac.uk

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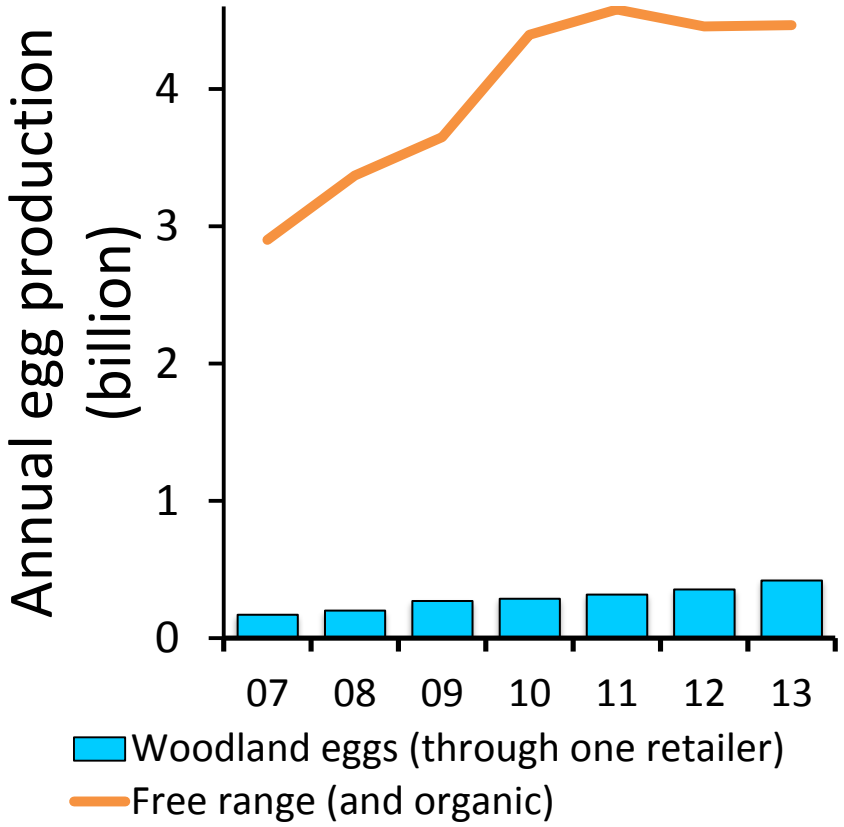
UK Egg Market



Annually 11.5 billion eggs consumed in UK (£990 million).

44% of these “free-range”

In 2013, about 400 million woodland eggs through Sainsbury’s supermarkets, equivalent to about 3.4% of the UK market. Other retailers also sell woodland eggs.

Woodland Eggs

- Woodland eggs meet requirements for “free-range” eggs (EC Regulation 589/2008) such as access to open space and less than 2500 hens per hectare.

- The Woodland Trust, a UK charity, specifies 20% cover in the free range area with some trees within a 20 m distance from the shed

Image: Mike Townsend, Woodland Trust

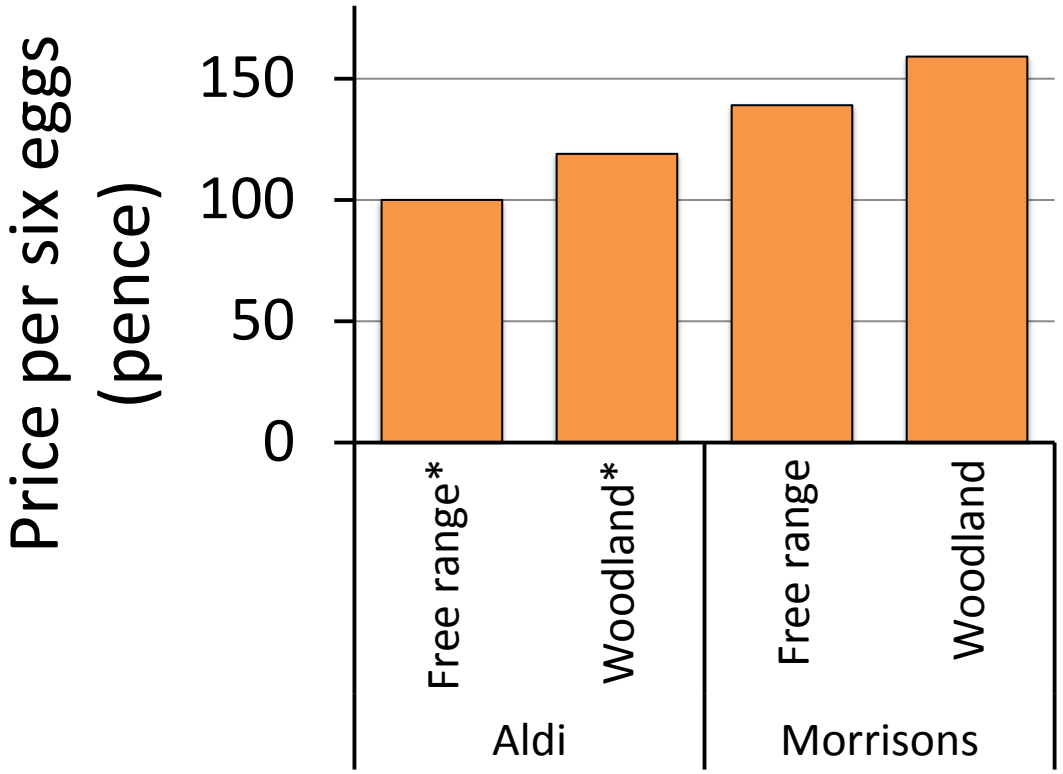
Objectives

- To determine the financial benefits and costs of woodland eggs from a farmer's perspective
- To determine the economic benefits and costs of woodland eggs from a societal perspective

Financial analysis: method

- Marginal cost-benefit analysis in Microsoft Excel
- Perspective of farmer
- 2000 hens per hectare
- Each hen lays 280 eggs per year
- 8% discount rate (Yates et al, 2006)
- Trees on 20% of area
- Timescale: 15 years

Benefits: price premium



Comparison of the price between free range and woodland eggs (source: retailers' websites, April 2014) (* large eggs)

Consumers are paying a premium of **20 pence for six woodland eggs** in two supermarkets

Benefits: price premium

Although some consumers were paying a premium of **20 pence** per six eggs; in our financial model we assumed that egg packers would give a price **premium to the producer of 1 pence per six eggs** (IGD, 2008).

Premium on egg price	(£ per six eggs)	**0.01**
Eggs per bird per year	(eggs hen^{-1})	**280**
Birds per hectare	(hens ha^{-1})	**2000**
Revenue from premium	(£ ha^{-1} a^{-1})	**933**

Benefits: Improved egg quality

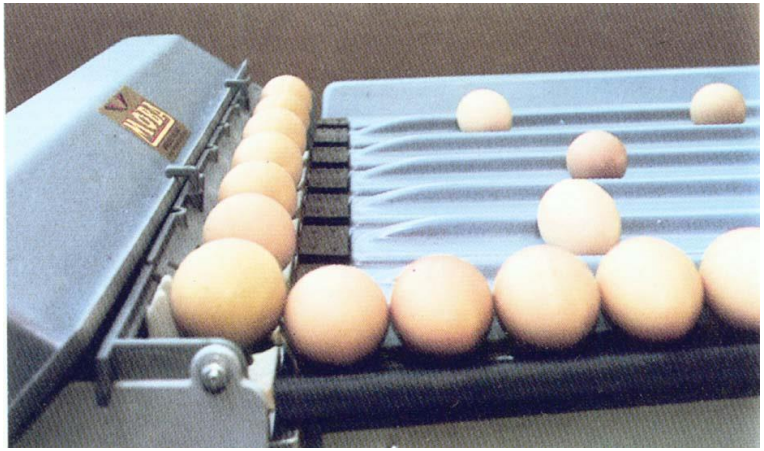


Image: Bellsouth Poultry Equipment eshop

Bright and Joret (2012) report that the proportion of eggs with poor quality shells fell by 1% when hens were given access to a woodland.

In 2013, class A eggs were typically sold by farmers to packers at £0.52 per six eggs (Defra, 2014), and the price received for seconds is usually only a third of that for class A eggs (Bright and Joret, 2012). For 2000 hens, the annual benefit would be £327 (Table 1).

Move to class A from seconds		
Additional revenue	(£ ha^{-1} a^{-1})	**327**

Costs: Hidden eggs

Image: The Poultry Guide
http://thepoultryguide.com/when-hens-start-and-stop-laying-eggs/
Bellsouth Poultry Equipment eshop

Our discussions with producers suggests that the trees could mean that some hens will lay their eggs there rather than in the sheds. In the absence of other data, we assumed the loss of one egg per hen per year.

Loss of eggs in field	(eggs ha^{-1})	**2000**
Loss of revenue	(£ ha^{-1} a^{-1})	**174**

Benefits and Costs of Woodland Component

Our assumptions included:

- Mixture of hazel, Scots pine, and oak on 20% of one hectare (173 trees ha^{-1}),
- Estimates of timber yields were based on Burgess et al (2000),
- Planting costs were estimated to be £380 ha^{-1} (assuming some external support for tree costs),
- Annual maintenance cost was assumed to be £60 ha^{-1}.
- Assumed change in land value from tree planting.

Financial analysis: summary

A premium of 1 pence per six woodland eggs, gave the farmer the equivalent of an additional £700 ha^{-1} per year over the first 15 years.

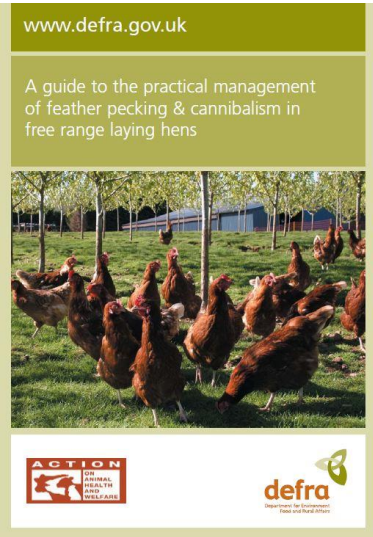
	Premium needed per six eggs to break even (pence)
Described "baseline" assumptions	0.25
Baseline but no reduced seconds	0.60
Baseline but annually 6 eggs lost per hen	1.19
Baseline but no tree revenue	0.25
No reduction in seconds & loss of 6 eggs per hen per year	1.54

Economic analysis – benefit value

	Ecosystem service	Assumptions	Societal benefit (pence per six eggs)
Regulating services	Ammonia capture	Each hen emits 2.0 mg h^{-1}; trees capture 8% ofNH_3; £2135 per tonne NH_3	<0.01
	C sequestration by trees	£16 per tonne of CO_2 in 2014	<0.01
Cultural services	Amenity value	Arboricultural Association method (2014)	0.18
	Animal welfare	Sense of protection from aerial predators	Not included

Societal benefits over 15 years: > 0.18 pence per six eggs

Hen welfare



Mortality

Bright and Joret (2012) observed: mortality rate of woodland hens was 1% lower than for free-range chicken (but the effect was not statistically significant).

Injurious feather pecking

Bright and Joret (2012) also report reduced injurious feather pecking by laying hens in a woodland environment

Some challenges

Challenges

Diseases from wild birds

Pest effects

Feed conversion ratio: positive or negative?

Is "woodland eggs" a generic term?

Conclusions

- There is a market for woodland eggs
- Retail premium to compensate farmers.
- Research is still needed to quantify and value the production and welfare benefits so that both producers and consumers can make informed choices.

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Acknowledgements

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